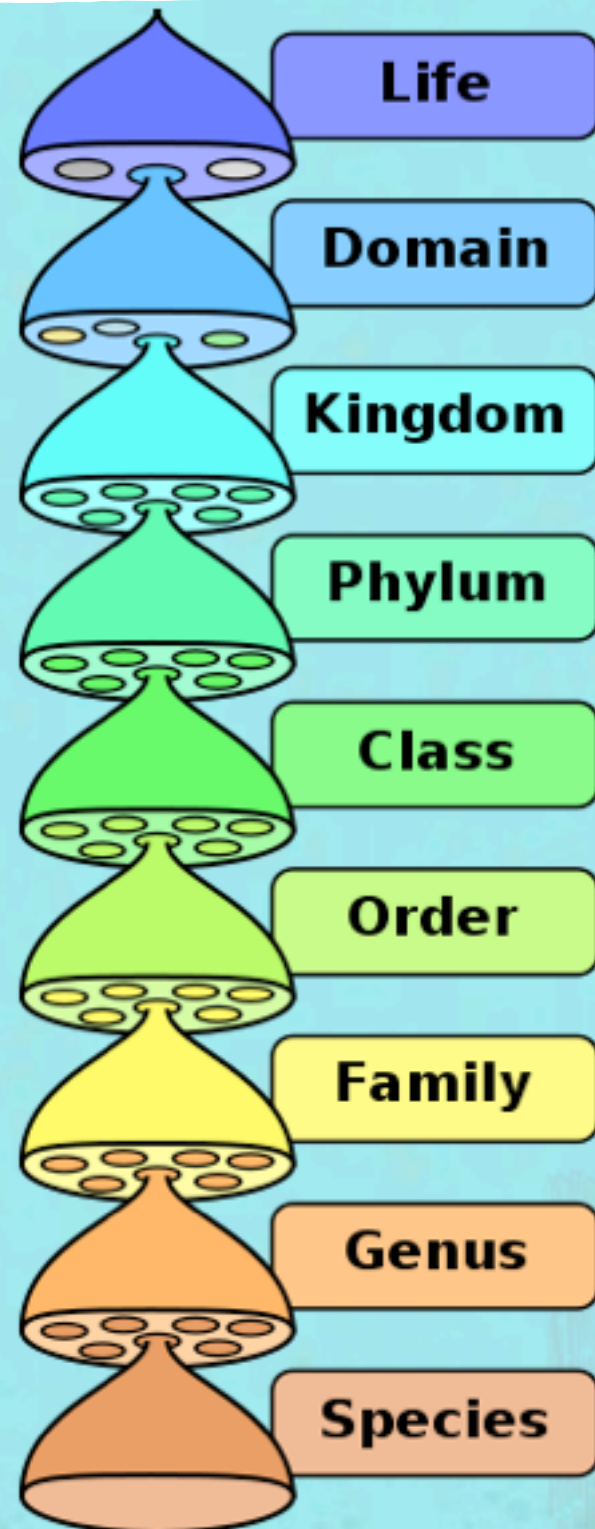


Marine Taxonomy

The Basics.

Taxonomy Review



Why use this system?

*Consistency throughout the Scientific Community

Breakdown of Marine Taxonomy

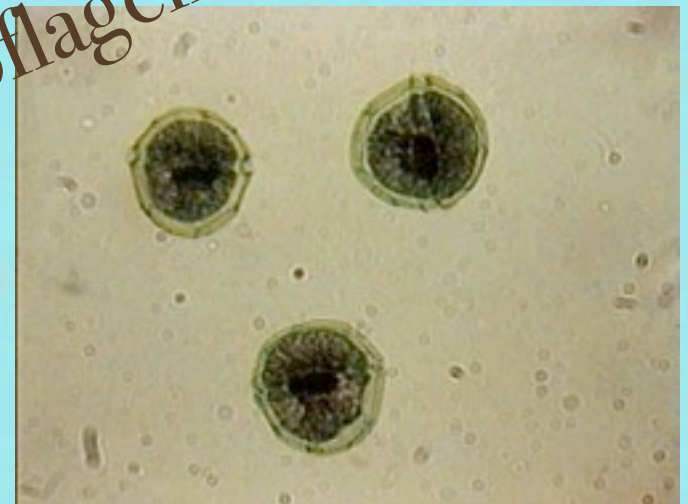
- * Kingdom Protista
- * Kingdom Plantae, Fungi, Bacteria
- * Kingdom Animalia
 - * Invertebrates and Vertebrates

Kingdom Protista: In Marine Environments

* What is a Protist?

- * unicellular
- * colonies of eukaryotic cells
- * autotrophic, mixotrophic, heterotrophic

Dinoflagellates

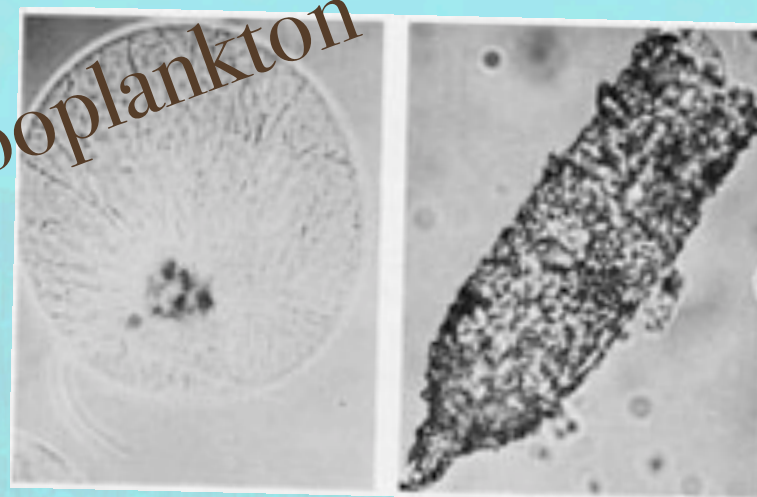


<http://virtual.yosemite.cc.ca.us/randerson/Marine%20Invertebrates/dinophyt.htm>

* Marine Examples:

- * Some Plankton
- * Some Algae

Zooplankton



<http://www.prism.washington.edu/lc/CLFISH497/Web5.html>

Kingdom Plantae, Fungi and Bacteria

In Marine Environments

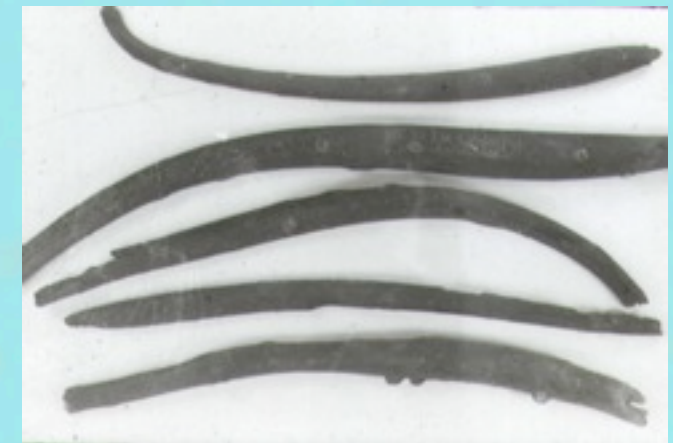
* Few TRUE Marine Plants

* Mangrove shrubs

* Grasses



http://dpi.qld.gov.au/28_9127.htm



* Fungi

* Grows on driftwood, docks, mangrove plants

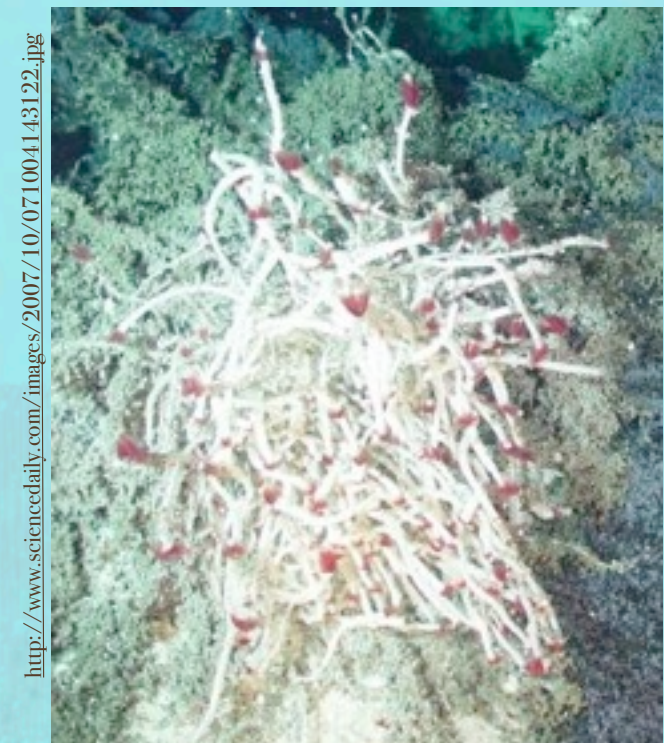
* Bacteria

* Hydrothermal Vents

* Cyanobacteria (Bacterioplankton)



<http://www.csuchico.edu/chem/facultyStaff/edwards.shtml>



<http://www.sciencedaily.com/images/2007/10/071004143122.jpg>

Kingdom Animalia

- * **Invertebrate**

- * Lacks Vertebral Column

- * **Vertebrate**

- * Intact Vertebral Column

Invertebrate Phyla in Marine Environment

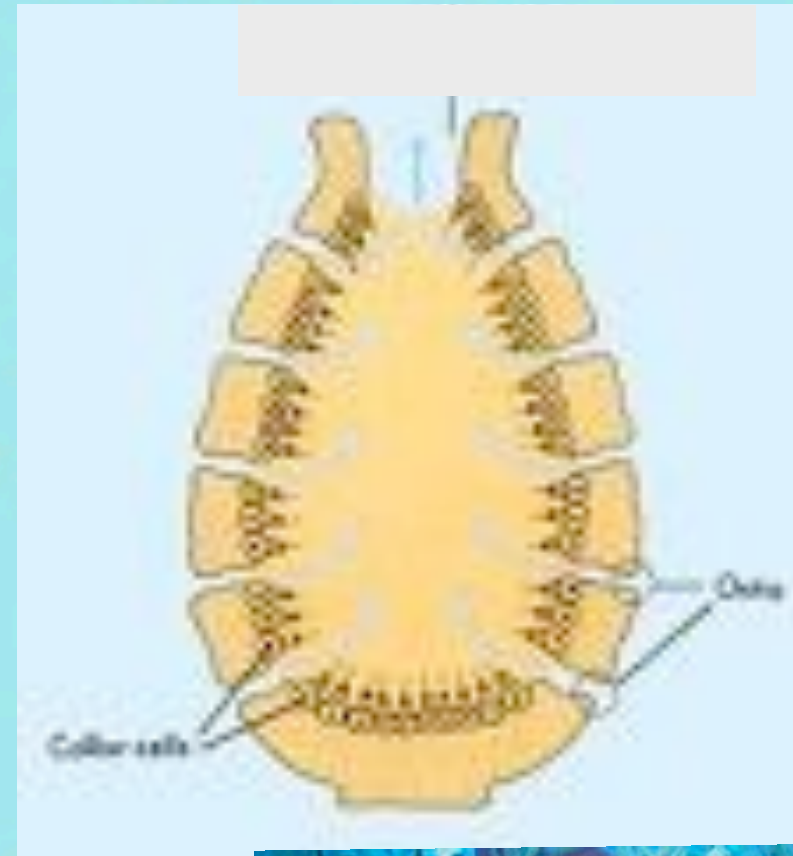
- * Porifera
- * Echinodermata
- * Mollusca
- * Arthropoda
- * Cnidaria
- * Ctenophora
- * Marine Worms
 - * Anelidia, Nematoda, Pogonophora, Platyhelminthes



Porifera: Sponges

porus : pores

- * No definite symmetry
- * Multicellular, no organs
- * Filter feeders
- * Sessile
- * Larval stage is planktonic
- * Inner space (not true body cavity)



http://oceanexplorer.noaa.gov/explorations/07twilightzone/logs/may23/media/sponges_galore.html

Echinodermata: Sea Stars and Urchins



echino: spiny *derm:* skin



- * Radial symmetry
- * Water vascular system (locomotion, respiration, feeding)
- * Tube feet
- * Internal skeleton
- * Spiny skin



Mollusca: Cephalopods, Gastropods, Bivalves

- * **All**

- * Mantle

- * Shell

- * **Cephalopoda** (*cephal*: head *pod*: foot)

- * Squid, octopus, nautilus

- * **Gastropoda** (*gastro*: stomach *pod*: foot)

- * Snails

- * **Bivalve** (*bi*: two)

- * Clams, oysters, mussels etc.

Arthropoda: Class Crustacean

Arthro: joint *pod*: foot

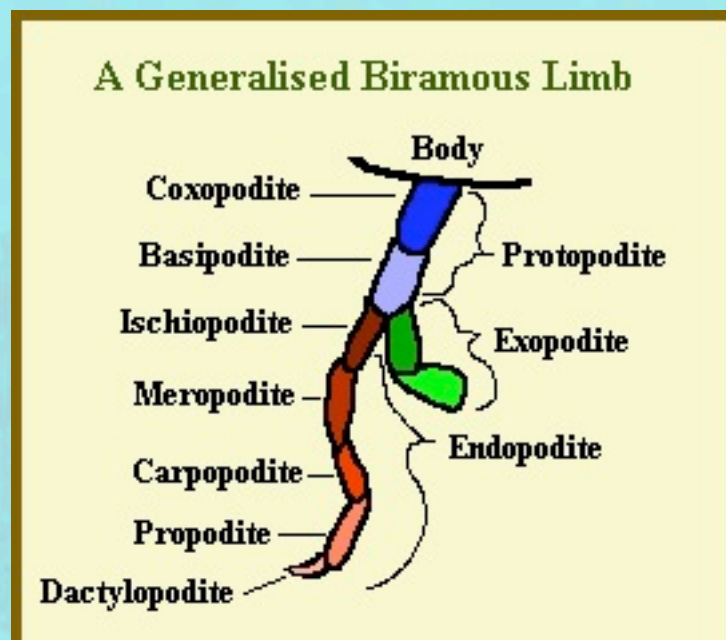
* All

- * Bilateral symmetry (most cases)
- * Exoskeleton
- * Jointed legs
- * Body divided into 2-3 sections



* Crustaceans

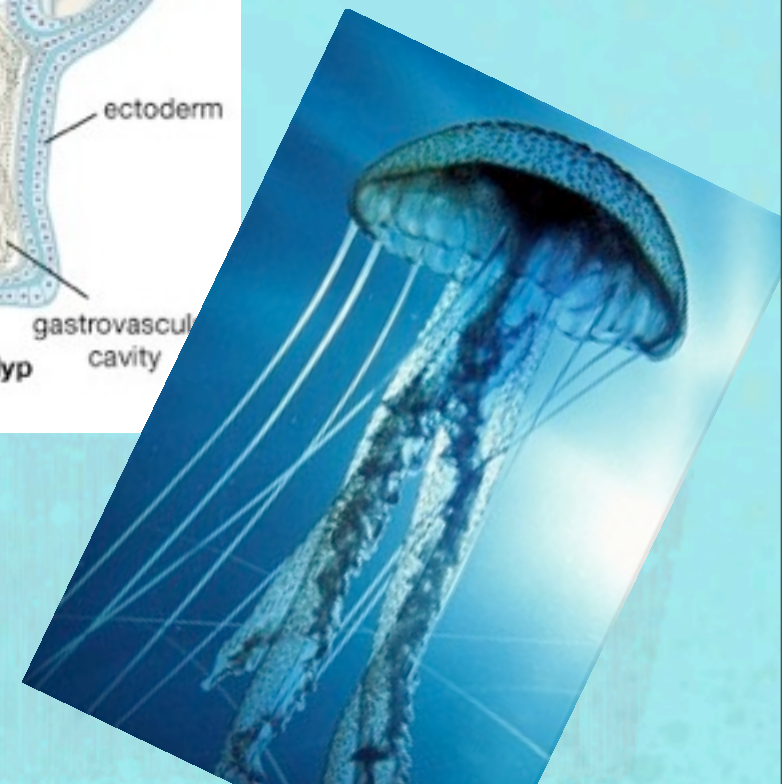
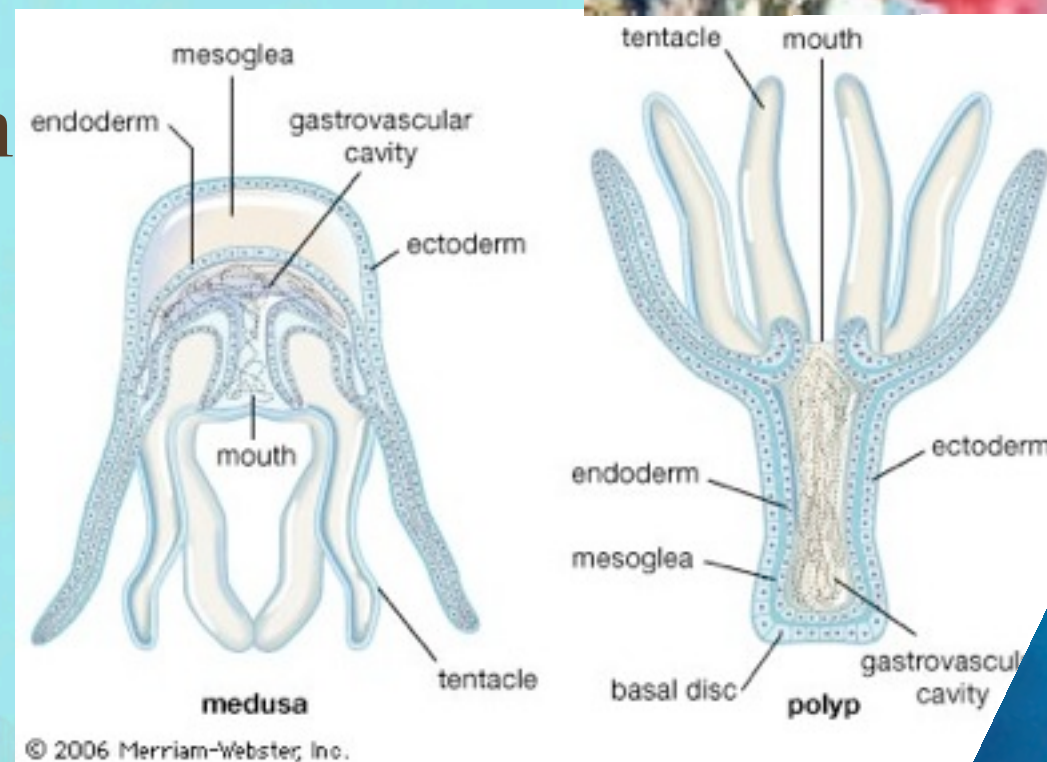
- * 2 pairs antennae
- * 2 branch on limbs



Cnidaria: Anemones, Sea Jellies, Corals

nide: to itch

- * Radial symmetry
- * Sac-like internal cavity
- * Tentacles around mouth
- * Nematocysts
- * Platonkic Larval form
- * 2 Body Forms
- * Medusa, and Polyp



Ctenophore: Comb Jellies

ktenos: comb *phoros*: bearing

- * Radial symmetry
- * Swims using plates of cilia (combs)
- * Well developed nerve net
- * Planktonic larval stage
- * Carnivorous



http://www.terraily.com/reports/And_The_First_Animal_On_Earth_Was_A_999.html



<http://www.seacortez.com/inverts/index.html>



Marine Worms

* Annelidia- *Annellus*: little ring

- * Bilateral symmetry
- * Segmented
- * Closed circulatory system



* Nematoda- *Nema*: thread

- * Bilateral symmetry
- * No circulatory system

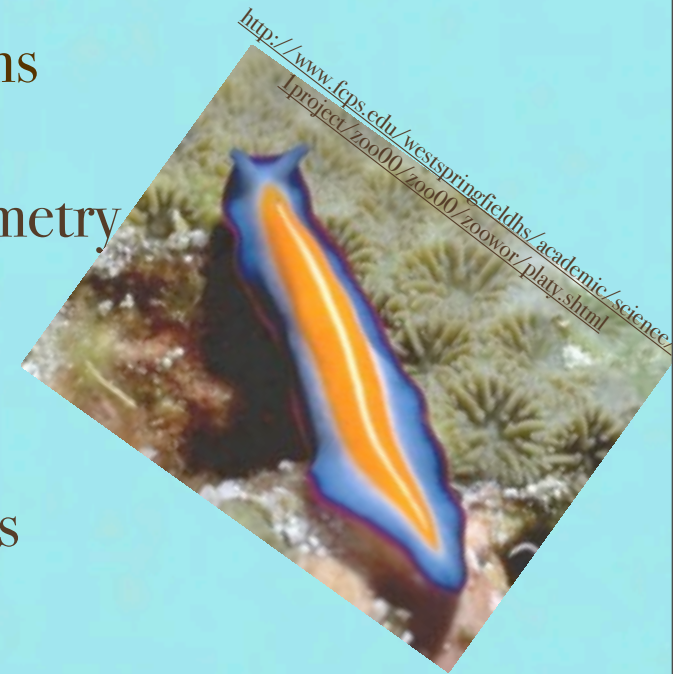


<http://www.dgukervis.nic.in/Giant%20tube%20worm.jpg>

* Platyhelminthes- *Platy*: flat

Helminthes: worms

- * Bilateral symmetry
- * Flat worms
- * Most parasites



* Pogonophora- *Pogo*: Bearded

- * Bilateral symmetry
- * Live in naturally secreted tubes
- * Feed on detritus, dissolved nutrients or through symbiosis with bacteria

A Closer Look At Marine Vertebrates

- * Phylum Chordata

- * 3 Classes of Fish

- * Marine Mammals

Chordata

* Pharyngeal Slits

- * Used for feeding
- * Later modified for respiration (fish)

* Endostyle

- * Primitive esophagus

* Post Anal Tail

* Notochord (some point of life cycle)

- * Dorsal, hollow nerve cord

* Urochordata-Tunicates

- * Filter feeders
- * Most go from Pelagic-sessile
- * Adults digest nerves needed for movement

* Cephalochordata-Lancelets

- * Notochord present throughout life

* Craniata-Lampreys

- * Have skull/cranium

3 Classes of Fish

* Cyclostomata- *Cyclo*: Round *Stomata*: Hole

- * Eel-like Jawless fish
- * Ex/ Lamprey, Hagfish



* Osteichthyes- *Osteo*: Bone *Ichthy*: Fish

- * Bony fish
- * Ex/ Salmon, Clownfish, Angelfish....



* Chondrichthyes- *Chond*: Cartilage

- * Cartilaginous fish
- * Ex/ Sharks, skates, rays, chimeras



First of all...

What is a Mammal?

- * Has hair or fur
- * Most give birth to live young
- * Mothers produce milk
- * Warm blooded
- * All are vertebrates
- * Have lungs to breath air

Marine Mammals

- * Pinnipeds: Seals and Sea Lions
- * Sirenia: Manatees and Dugongs
- * Cetaceans: Whales and Dolphins
 - * Odontocetes: toothed whales
 - * Includes dolphins
 - * Mysticetes : baleen whales

